

Appendix H

Preliminary Planning-Level Cost Estimates



BOULDER SOUTH ALTERNATIVES ANALYSIS
Planning Level Estimate of Costs

Spot Improvements

Item Description	Approx. Quantity	Unit Meas.	Estimated Unit Price	Amount
Clearing & Grubbing	1	AC	\$2,542	\$3,000
Remove Existing Pavement	0	SY	\$5.85	\$0
Unclassified Excavation Including Haul	1,400	CY	\$4.00	\$6,000
Unclassified Borrow	5,400	CY	\$4.30	\$24,000
Rock Excavation	0	CY	\$11.00	\$0
Base	1,000	CY	\$27.50	\$28,000
Crushed Aggregate Course	2,000	CY	\$17.54	\$36,000
Plant Mix Surfacing Grade S	15,500	Ton	\$27.47	\$426,000
Culverts				
18" Diameter	0	LF	\$44.00	\$0
24" Diameter	0	LF	\$60.17	\$0
36" Diameter	0	LF	\$124.05	\$0
48" Diameter	0	LF	\$122.16	\$0
Remove Existing Bridge Structures	0	EA	\$10,695	\$0
New Bridge Structures				
Single Span 1	0	SF	\$95	\$0
Single Span 2	0	SF	\$95	\$0
Single Span 3	0	SF	\$95	\$0
Multi Span 1	0	SF	\$112	\$0
Multi Span 2	0	SF	\$112	\$0
Painting and Striping	700	Gallons	\$58.45	\$41,000
Signing	0	Lump Sum	\$52,000	\$0
Seeding	0	AC	\$423	\$0
Fencing	0	LF	\$2.53	\$0
Wetland Mitigation	0	AC	\$30,000	\$0
SUBTOTAL 1				\$564,000
Mobilization @ 10%	1	Lump Sum	\$57,000	\$57,000
Miscellaneous @ 25%	1	Lump Sum	\$141,000	\$141,000
SUBTOTAL 2 (2009)				\$762,000
SUBTOTAL 2 (Let Date of 2012)				\$832,658
Indirect Cost (IDC) - Construction	1		14.06%	\$117,072
Planning / Survey/ Design @ 10%	1	Lump Sum	\$83,000	\$83,000
Traffic Control @ 4%	1	Lump Sum	\$33,300	\$34,000
Construction Contingencies @ 25%	1	Lump Sum	\$208,200	\$209,000
Construction Management @ 15%	1	Lump Sum	\$124,900	\$125,000
Acquire Right-of-Way	1	AC	\$3,500	\$4,000
TOTAL				\$1,405,000

Unit Prices from January to December 2008 MDT Average Prices Catalog



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Existing Alignment				
Item Description	Approx. Quantity	Unit Meas.	Estimated Unit Price	Amount
Clearing & Grubbing	100	AC	\$2,542	\$255,000
Remove Existing Pavement	96,000	SY	\$5.85	\$562,000
Unclassified Excavation Including Haul	217,000	CY	\$4.00	\$868,000
Unclassified Borrow	0	CY	\$4.30	\$0
Rock Excavation	6,000	CY	\$11.00	\$66,000
Base	38,800	CY	\$27.50	\$1,067,000
Crushed Aggregate Course	85,000	CY	\$17.54	\$1,491,000
Plant Mix Surfacing Grade S	37,700	Ton	\$27.47	\$1,036,000
Culverts				
18" Diameter	1,020	LF	\$44.00	\$45,000
24" Diameter	1,587	LF	\$60.17	\$96,000
36" Diameter	828	LF	\$124.05	\$103,000
48" Diameter	168	LF	\$122.16	\$21,000
Remove Existing Bridge Structures	4	EA	\$10,695	\$43,000
New Bridge Structures				
Single Span 1	1,421	SF	\$95	\$136,000
Single Span 2	1,421	SF	\$95	\$136,000
Single Span 3	1,421	SF	\$95	\$136,000
Multi Span 1	4,264	SF	\$112	\$478,000
Multi Span 2	0	SF	\$112	\$0
Painting and Striping	700	Gallons	\$58.45	\$41,000
Signing	1	Lump Sum	\$39,000	\$39,000
Seeding	70	AC	\$423	\$30,000
Fencing	66,528	LF	\$2.53	\$169,000
Wetland Mitigation	20	AC	\$30,000	\$600,000
SUBTOTAL 1				\$7,418,000
Mobilization @ 10%	1	Lump Sum	\$742,000	\$742,000
Miscellaneous @ 25%	1	Lump Sum	\$1,854,500	\$1,855,000
SUBTOTAL 2 (2009)				\$10,015,000
SUBTOTAL 2 (Let Date of 2012)				\$10,943,661
Indirect Cost (IDC) - Construction	1		14.06%	\$1,538,679
Planning / Survey / Design @ 10%	1	Lump Sum	\$1,094,000	\$1,094,000
Traffic Control @ 15%	1	Lump Sum	\$1,641,500	\$1,642,000
Construction Contingencies @ 25%	1	Lump Sum	\$2,735,900	\$2,736,000
Construction Management @ 15%	1	Lump Sum	\$1,641,500	\$1,642,000
Acquire Right-of-Way	10	AC	\$3,500	\$35,000
TOTAL				\$19,631,000

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Eastern Alignment

Item Description	Approx. Quantity	Unit Meas.	Estimated Unit Price	Amount
Clearing & Grubbing	131	AC	\$2,542	\$334,000
Remove Existing Pavement	24,556	SY	\$5.85	\$144,000
Unclassified Excavation Including Haul	411,000	CY	\$4.00	\$1,644,000
Unclassified Borrow	221,000	CY	\$4.30	\$951,000
Rock Excavation	0	CY	\$11.00	\$0
Base	39,500	CY	\$27.50	\$1,087,000
Crushed Aggregate Course	85,900	CY	\$17.54	\$1,507,000
Plant Mix Surfacing Grade S	37,900	Ton	\$27.47	\$1,041,000
Culverts				
18" Diameter	624	LF	\$44.00	\$28,000
24" Diameter	0	LF	\$60.17	\$0
36" Diameter	2,180	LF	\$124.05	\$271,000
48" Diameter	0	LF	\$122.16	\$0
Remove Existing Bridge Structures	2	EA	\$10,695	\$22,000
New Bridge Structures				
Single Span 1	1,421	SF	\$95	\$136,000
Single Span 2	1,421	SF	\$95	\$136,000
Single Span 3	0	SF	\$95	\$0
Multi Span 1	11,220	SF	\$112	\$1,257,000
Multi Span 2	14,960	SF	\$112	\$1,676,000
Painting and Striping	700	Gallons	\$58.45	\$41,000
Signing	1	Lump Sum	\$39,000	\$39,000
Seeding	75	AC	\$423	\$32,000
Fencing	67,690	LF	\$2.53	\$172,000
Wetland Mitigation	12	AC	\$30,000	\$360,000
SUBTOTAL 1				\$10,878,000
Mobilization @ 10%	1	Lump Sum	\$1,088,000	\$1,088,000
Miscellaneous @ 25%	1	Lump Sum	\$2,719,500	\$2,720,000
SUBTOTAL 2 (2009)				\$14,686,000
SUBTOTAL 2 (Let Date of 2012)				\$16,047,789
Indirect Cost (IDC) - Construction	1		14.06%	\$2,256,319
Planning / Survey/ Design @ 10%	1	Lump Sum	\$1,605,000	\$1,605,000
Traffic Control @ 4%	1	Lump Sum	\$641,900	\$642,000
Construction Contingencies @ 25%	1	Lump Sum	\$4,011,900	\$4,012,000
Construction Management @ 15%	1	Lump Sum	\$2,407,200	\$2,408,000
Acquire Right-of-Way	100	AC	\$3,500	\$350,000
TOTAL				\$27,321,000

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Planning Level Estimate of Costs

Western Alignment

Item Description	Approx. Quantity	Unit Meas.	Estimated Unit Price	Amount
Clearing & Grubbing	108	AC	\$2,542	\$275,000
Remove Existing Pavement	32,000	SY	\$5.85	\$188,000
Unclassified Excavation Including Haul	285,595	CY	\$4.00	\$1,143,000
Unclassified Borrow	610,023	CY	\$4.30	\$2,624,000
Rock Excavation	472,388	CY	\$11.00	\$5,196,269
Base	42,000	CY	\$27.50	\$1,155,000
Crushed Aggregate Course	92,000	CY	\$17.54	\$1,614,000
Plant Mix Surfacing Grade S	41,000	Ton	\$27.47	\$1,126,000
Culverts				
18" Diameter	340	LF	\$44.00	\$15,000
24" Diameter	529	LF	\$60.17	\$32,000
36" Diameter	276	LF	\$124.05	\$35,000
48" Diameter	392	LF	\$122.16	\$48,000
Remove Existing Bridge Structures	2	EA	\$10,695	\$22,000
New Bridge Structures				
Single Span 1	1,421	SF	\$95	\$136,000
Single Span 2	1,421	SF	\$95	\$136,000
Single Span 3	0	SF	\$95	\$0
Multi Span 1	112,000	SF	\$112	\$12,544,000
Multi Span 2	0	SF	\$112	\$0
Painting and Striping	750	Gallons	\$58.45	\$44,000
Signing	1	Lump Sum	\$52,000	\$52,000
Seeding	78	AC	\$423	\$34,000
Fencing	74,176	LF	\$2.53	\$188,000
Wetland Mitigation	30	AC	\$30,000	\$900,000
SUBTOTAL 1				\$27,507,269
Mobilization @ 10%	1	Lump Sum	\$2,751,000	\$2,751,000
Miscellaneous @ 25%	1	Lump Sum	\$6,876,800	\$6,877,000
SUBTOTAL 2 (2009)				\$37,135,269
SUBTOTAL 2 (Let Date of 2012)				\$40,578,711
Indirect Cost (IDC) - Construction	1		14.06%	\$5,705,367
Planning / Survey/ Design @ 10%	1	Lump Sum	\$4,058,000	\$4,058,000
Traffic Control @ 4%	1	Lump Sum	\$1,623,100	\$1,624,000
Construction Contingencies @ 25%	1	Lump Sum	\$10,144,700	\$10,145,000
Construction Management @ 15%	1	Lump Sum	\$6,086,800	\$6,087,000
Acquire Right-of-Way	77	AC	\$3,500	\$268,000
TOTAL				\$68,466,000

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The **Clearing and Grubbing** category was calculated as the area from the edge of required right-of-way to the opposite edge of required right-of-way. This category is largest for the eastern alignment because it would follow a narrow gravel county road over some portions of the corridor between MP 31.8 and 35.7, but would also traverse some undisturbed land. The western alignment would travel undisturbed territory over its entire length between points of intersection with the existing roadway, but there would be rock cuts over much of the length, reducing the amount of clearing and grubbing.

The **Unclassified Excavation Including Haul and Unclassified Borrow** categories were calculated by modeling the entire valley area based on USGS topographical maps. The western alignment would require the greatest amount of earthwork, followed by the eastern alignment and the existing alignment. While the existing MT 69 alignment is mostly flat, the eastern alignment would involve work in hilly terrain, and the western alignment would traverse mountainous terrain.

The **Base, Crushed Aggregate Course, and Plant Mix Surfacing** categories are larger for the eastern and western alignments as compared to the existing alignment due to longer roadway lengths. The eastern alignment is approximately 0.11 miles longer and the western alignment is approximately 0.52 miles longer than the existing MT 69 alignment.

There are four **bridges** along the existing MT 69 alignment, including three single-span bridges and one multi-span bridge. These bridges would be removed and replaced. Two of the existing single-span bridges would also be removed and replaced under the eastern and western alignments. Additionally, two new bridges would be required along the eastern alignment, both of which would be multi-span bridges. The cost of each multi-span bridge on the eastern alignment is higher than the cost of the multi-span bridge on the existing MT 69 alignment because they are substantially longer. The western alignment would require four new multi-span bridges in order to span several deep ravines.

The **Miscellaneous** category is estimated to be up to 25 percent for this project because of the potential for unknown factors. It includes items such as:

- Sawcutting pavement
- Fence replacement
- Riprap
- Public relations
- Topsoil
- Traffic gravel
- Seal coat
- Guardrail
- Cattle guards
- Noxious weed control
- Mail boxes
- Slope treatment
- Watering
- Ditch or channel excavation
- Shoring, cribbing, or extra excavation
- Asphalt for tack coat
- Incidental asphalt concrete pavement
- Unsuitable excavation
- Temporary striping
- Temporary water pollution/erosion control

Several cost categories are calculated as percentages of construction, including the mobilization and miscellaneous categories. Additionally, the **Planning/Survey/Design, Traffic Control, Construction Contingencies, and Construction Management** categories were calculated as percentages of the respective subtotals noted in Table 8.3. These categories were calculated using the same percentage factors for each alternative, with the exception of Traffic Control. A

smaller percentage was used to calculate Traffic Control for the eastern and western alignments due to the fact that these could be constructed while the majority of traffic remained on the existing MT 69 alignment. Reconstruction along MT 69 would require substantial traffic control and/or a detour route. The Planning/Survey/Design category does not include the cost of environmental clearance documentation. A construction contingency of 25 percent, the maximum amount recommended by MDT's cost estimation guidelines, was chosen because of the potential for higher cost of right-of-way acquisition in this area than estimated due to lack of landowner support for the project as well as rapid increases in land values in Montana, and what is considered to be a high potential for unknown factors due to the controversial nature of the project.

A larger amount of **right-of-way** would be required for the eastern alignment in comparison to the existing alignment mainly because the eastern alignment would involve an almost entirely new alignment between MP 31.8 and 35.7. There are portions of this alignment that parallel the existing county road. Typically, right-of-way along county roads in Montana consists of a 60-foot easement, with 30 feet on each side of the center line. The county road was constructed on an easement, and no right-of-way is owned by either Jefferson County or the state along this route. The total right-of-way calculated for the eastern alignment assumes that there is no existing county right-of-way owned along the county road. The western alignment would require new right-of-way along its entire length, but would involve substantial rock cuts, where right-of-way needs would be lessened due to the steep slope of the cuts.